

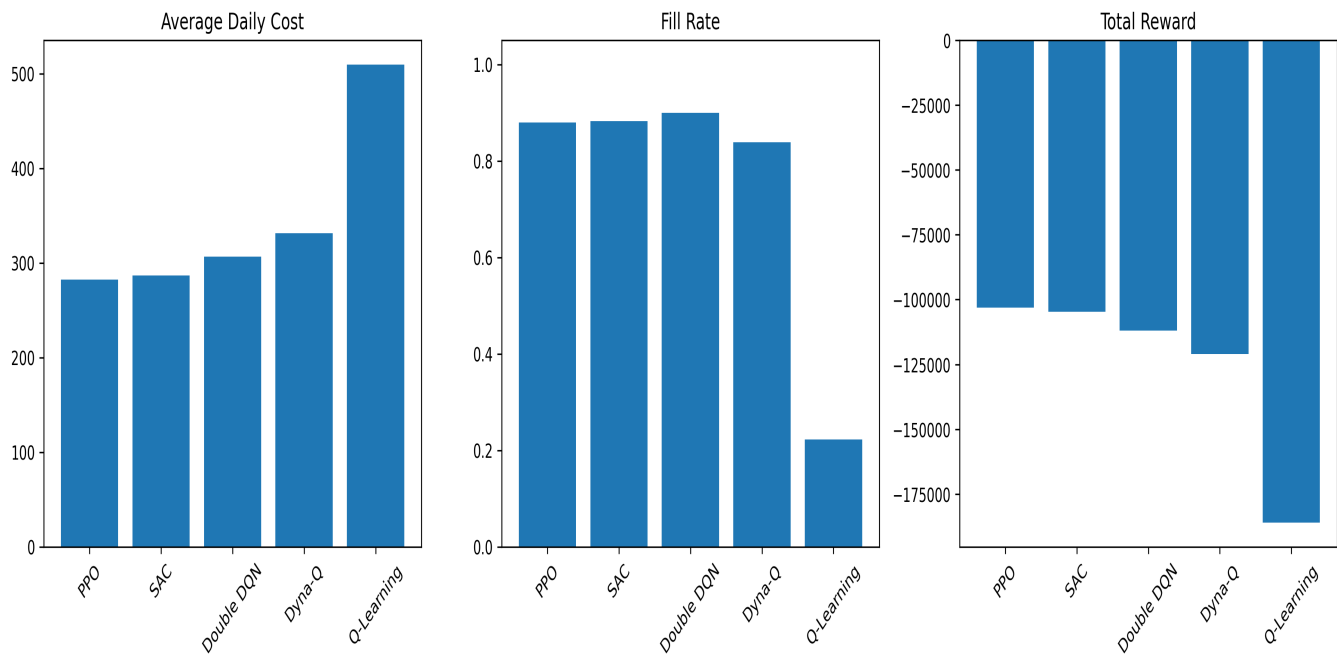
# Inventory Management RL Evaluation Report

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## Summary Comparison

Algorithm	Avg Cost	Fill Rate	Stockout Rate	Avg Inventory	Total Reward
PPO	\$282.44	87.95%	19.10%	89.6	-103089.45
SAC	\$286.87	88.22%	22.58%	65.3	-104708.55
Double DQN	\$306.54	89.97%	15.70%	98.1	-111887.30
Dyna-Q	\$331.36	83.84%	22.19%	111.2	-120946.10
Q-Learning	\$509.69	22.25%	94.11%	1.4	-186035.20

# Performance Comparison Plots



## Detailed Evaluation Results

### Q-Learning Evaluation Report

#### **COSTS**

Avg Daily Cost: \$509.69 (+/-9.87)

Holding Cost: \$504.20

Stockout Cost: \$161715.00

Ordering Cost: \$23816.00

#### **SERVICE LEVEL**

Fill Rate: 22.2%

Stockout Rate: 94.1%

#### **INVENTORY**

Avg Inventory: 1.4 units

#### **PERFORMANCE**

Total Reward: -186035.20

### PPO Evaluation Report

#### **COSTS**

Avg Daily Cost: \$282.44 (+/-6.12)

Holding Cost: \$32715.25

Stockout Cost: \$25183.56

Ordering Cost: \$45190.64

#### **SERVICE LEVEL**

Fill Rate: 88.0%

Stockout Rate: 19.1%

#### **INVENTORY**

Avg Inventory: 89.6 units

#### **PERFORMANCE**

Total Reward: -103089.45

### SAC Evaluation Report

#### **COSTS**

Avg Daily Cost: \$286.87 (+/-6.95)

Holding Cost: \$23851.65

Stockout Cost: \$24541.01

Ordering Cost: \$56315.89

#### **SERVICE LEVEL**

Fill Rate: 88.2%

Stockout Rate: 22.6%

#### **INVENTORY**

Avg Inventory: 65.3 units

#### **PERFORMANCE**

Total Reward: -104708.55

## Dyna-Q Evaluation Report

### COSTS

Avg Daily Cost: \$331.36 (+/-14.21)

Holding Cost: \$40597.10

Stockout Cost: \$33717.00

Ordering Cost: \$46632.00

### SERVICE LEVEL

Fill Rate: 83.8%

Stockout Rate: 22.2%

### INVENTORY

Avg Inventory: 111.2 units

### PERFORMANCE

Total Reward: -120946.10

DOUBLEDQN

## Double DQN Evaluation Report

### COSTS

Avg Daily Cost: \$306.54 (+/-5.17)

Holding Cost: \$35812.30

Stockout Cost: \$20981.00

Ordering Cost: \$55094.00

### SERVICE LEVEL

Fill Rate: 90.0%

Stockout Rate: 15.7%

### INVENTORY

Avg Inventory: 98.1 units

### PERFORMANCE

Total Reward: -111887.30

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